WHAT IS CLAIMED IS:

1. An intelligent control circuit for pixel defects in a sensor, the control circuit comprising:

a defective pixel detection circuit for detecting whether an underlying pixel is defective; and

a pixel value restoration circuit for replacing the value of the underlying pixel, if defective, with a restoration value derived from the values of neighboring pixels;

wherein the control circuit operates in real-time.

2. The circuit of claim 1 wherein the defective pixel detection circuit comprises:

a white pixel detection circuit for detecting stuck high defects;

a dark pixel detection circuit for detecting stuck low defects; and

an abnormal sensitivity detection circuit for detecting abnormal sensitivity defects.

3. The method of claim 2 wherein the underlying pixel is processed by at least one of the white pixel detection circuit, dark pixel detection circuit, and abnormal sensitivity detection circuit.

4. The circuit of claim 3 wherein the white pixel detection circuit, the dark pixel detection circuit, and the abnormal sensitivity detection circuit process the underlying pixel serially.

5. The circuit of claim 3 wherein at least two of the white pixel detection circuit, the dark pixel detection circuit, and the abnormal sensitivity detection circuit process the underlying pixel in parallel.

6. The circuit of claim 1 wherein the neighboring pixels comprise:

a first group; and

a second group, each group being processed by the defective pixel detection circuit separately.

7. The circuit of claim 6 wherein the first group comprises a first plurality of pixels immediately surrounding the underlying pixel.

8. The circuit of claim 6 wherein the second group comprises a second plurality of pixels immediately surrounding the first group.

9. The circuit of claim 6 wherein the first and second groups form a rectangular shape.

10. The circuit of claim 6 wherein the first and second groups form a diamond shape.

11. The circuit of claim 6 wherein the first and second groups incorporate the Bayer pattern.

12. The circuit of claim 1 wherein the pixel value restoration circuit comprises a line-edge feature detection circuit for detecting whether a line or an edge feature passes through the underlying pixel.

13. The circuit of claim 1 wherein the pixel value restoration circuit comprises a spatially adaptive interpolation filter for deriving a restoration value.

14. The circuit of claim 1 wherein the sensor is a CCD/CMOS sensor.

15. An intelligent control circuit for pixel defects in a sensor, the control circuit comprising:

a defective pixel detection circuit for detecting whether an underlying pixel is defective, wherein the detection occurs without prior knowledge of any pixel defects; and

a pixel value restoration circuit for replacing the value of the underlying pixel, if defective, with a restoration value derived from the values of neighboring pixels.

16. The circuit of claim 15 wherein the defective pixel detection circuit determines the type of defect of an underlying pixel, the type of defect being one of stuck high, stuck low, or abnormally sensitive.

17. A method for processing pixel defects in a sensor, the method comprising:

measuring the value of an underlying pixel;

determining whether the underlying pixel is defective;

deriving a restoration value from the values of neighboring pixels if the underlying pixel is defective; and

replacing the value of the underlying pixel with a restoration value.

18. The method of claim 17 wherein the step of determining comprises at least one of the following types of assessing:

assessing whether the underlying pixel is stuck high;

assessing whether the underlying pixel is stuck low; and

assessing whether the underlying pixel is abnormally sensitive.

19. The method of claim 18 wherein the underlying pixel is processed serially such that a first type of assessing is followed by a second type of assessing if the no defect is found during the first type of assessing, and wherein the second type of assessing is followed by a third type of assessing if the no defect is found during the second type of assessing.

20. The method of claim 18 wherein at least two of the types of assessing are processed in parallel.

21. The method of claim 18 wherein the step of determining further comprises grouping the neighboring pixels into at least a first group and a second group, the first group and the second group being processed separately;

wherein the step of assessing whether the underlying pixel is stuck high further comprises:

comparing the value of the underlying pixel with a white threshold value; and

calculating a difference value if the underlying pixel is greater than the white threshold value, the difference value being derived from comparing the underlying pixel with the first group, wherein the underlying pixel is declared to be stuck high if the difference value is greater than the white threshold value.

wherein the step of assessing whether the underlying pixel is stuck low further comprises:

comparing the value the underlying pixel with a dark threshold value; and

calculating a difference value if the underlying pixel is less than the dark threshold value, the difference value being derived from comparing the underlying pixel with the first group, wherein the underlying pixel is declared to be stuck low if the difference value is greater than the dark threshold value.

wherein the step of assessing whether the underlying pixel is abnormally sensitive further comprises:

comparing the value of the underlying pixel value with a projected value, the projected value being derived from the second group, wherein the underlying pixel is declared to be an abnormal pixel if the underlying pixel value varies from the projected value beyond a certain percentage.

22. The method of claim 21 wherein the first group comprises a first plurality of pixels that immediately surround the underlying pixel.

23. The method of claim 21 wherein the second group comprises a second plurality of pixels that immediately surround the first group.

24. The method of claim 23 wherein the second group comprises the first group.

25. The method of claim 21 wherein the first group and the second group are the same.

26. The method of claim 17 further comprising detecting whether a line or an edge feature passes through the underlying pixel if determined to be defective.

27. The method of claim 26 wherein the step of detecting is achieved with a line-edge feature algorithm.

28. The method of claim 17 wherein the restoration value is derived from the values of the neighboring pixels using one-dimensional extrapolation.

29. The method of claim 17 wherein the restoration value is derived from the values of the neighboring pixels using two-dimensional extrapolation.

30. The method of claim 17 wherein the step of replacing is achieved with a spatially adaptive interpolation filter.

31. The method of claim 17 wherein the step of replacing comprises applying a spatially adaptive interpolation along the direction of a line or edge feature if detected.